

Technology Development of Potential Local Resources for Food and Health

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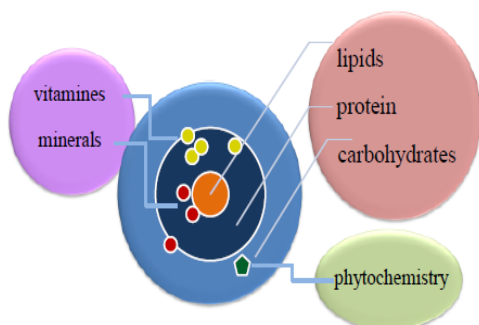


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Quality of Foods



Functional and Nutraceutical Substances in Food System



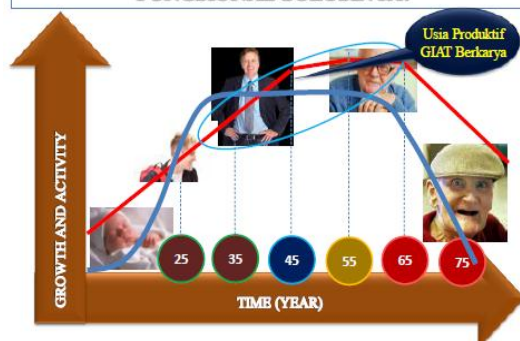
Functional Foods

Food that have specific physiological or nutritional effects- nutraceuticals (Schmid and Labuza, 2000)

A functional food must remain food and it must demonstrate its effects in amounts that can normally be expected to be consumed in the diet: it is not a pill or capsule, but part of the normal food pattern (Roberfroid, 2005).

A food can be regarded as functional if it is satisfactorily demonstrated to affect beneficially one or more target functions in the body, beyond adequate nutritional effects in a way that is relevant to either improved stage of health and well-being and/or reduction of risk of disease

TUBUH SEHAT SEMASA USIA TUA? PANGAN FUNGSIONAL SOLUSINYA!



There is close correlation between food and health!

you are what you eat



How food affects on our health



This grandmother feels "hidup" 1000 tahun" after drinking or eating yoghurt

THESE TWO PINDANG ARE SIMILAR



PINDANG SALMON WITH YOGHURT BROTH FROM MANNHEIM

PINDANG PATIN WITH TEMPOYAK BROTH FROM PLEMBANG

YOGHURT, YAKULT, AND TEMPOYAK



YOGHURT

YAKULT

TEMPOYAK

YOGHURT, YAKULT, AND TEMPOYAK ARE KIND OF FOOD PROCESSED BY LACTIC ACID BACTERIA FOR FERMENTATION IN ANAEROBIC CONDITION

Lactic Acid Bacteria in Tempoyak

No	LAB	Source	Reference
1	<i>Lactobacillus fermentum</i>	Indonesia	Izza, 2000
2	<i>Lactobacillus mali</i>	Malaysia	Leisner <i>et al</i> , 2001
3	<i>L. corynebacterium</i>	Indonesia	Wirawati, 2002
4	<i>Leuconostok mesenteroides</i>	Indonesia	Wirawati, 2002
5	<i>Lactobacillus plantarum</i>	Malaysia	Anin <i>et al</i> , 2004
6	<i>Pediococcus acidilactici</i>	Indonesia	Yuliana, 2004
7	<i>Lactobacillus fersanum</i>	Indonesia	Nur, 2005
8	<i>Lactobacillus casei</i>	Indonesia	Nur, 2005
9	<i>Lactobacillus durianis</i>	Malaysia	Leisner <i>et al</i> , 2005
10	<i>Leuconostoc durionis</i>	Malaysia	Leisner <i>et al</i> , 2005
11	<i>Lactobacillus brevis</i>	Indonesia	Yuliana <i>et al</i> , 2009

Have you drink it today?

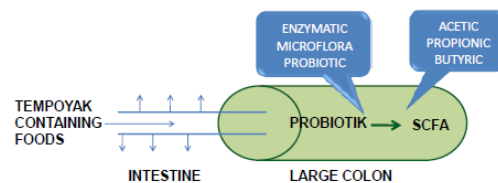
Yakult Functional Probiotic:

1 bottle = contain 6,5 milyar of LAB Cells

2 bottles = 13 Cells of LAB

Based on lab contents, 2 bottles of yakult similar to 2 tea spoons of tempoyak!

TEMPOYAK AS PREBIOTIC



Action of tempoyak mechanisms as probiotic

Cassava: One of The Potential Resources For Foods and Health

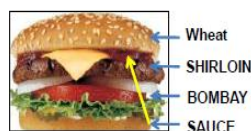


GOOD CASSAVA: Depend on Starch (amylum) content, dietary fibre, glycoprotein, linamarin, and lotaustralin

FIVE POINTS FOR FOOD PRODUCT DEVELOPMENT

- Pride of Nationalism
- Product Competitiveness
- Taste Uniformity
- Functionality Aspects
- Market Orientation

Pride of Nationalisms Have to be Developed



BURGER

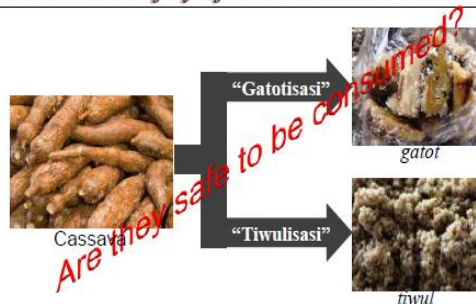
A foreign product, not
Indonesian Food



COMBRO

Local Food, Indigenous
Product of Indonesia

The Higher Technology Compare to Combrow Production: Safety of Cassava and its Products



HIGHER TECHNOLOGY

The way to make tiwul better?



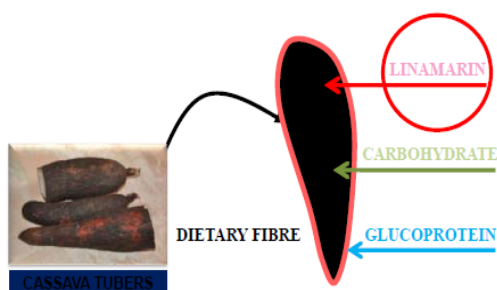
THE DEVELOPMENT OF FOOD PROCESS

Deeply Science of Cassava

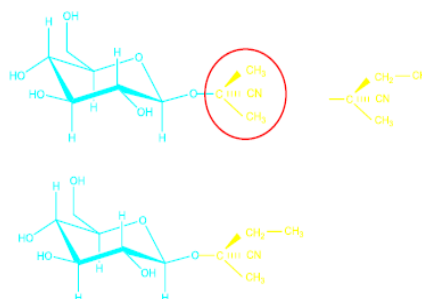


Cassava tuber consists of 15-1000 mg/kg linamarin (Simeonova & Fishbein, 2004):	
Sweet Cassava	: < 50 mg/ kg
Common Cassava	: 50-100 mg/ kg
Bitter Cassava	: > 100 mg/ kg

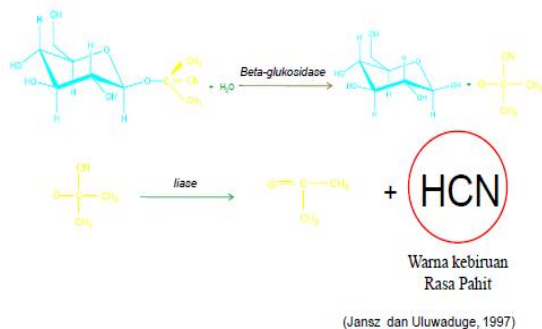
Linamarin in The Cassava Tuber: Key of Safety



Linamarin dan Lotaustralin



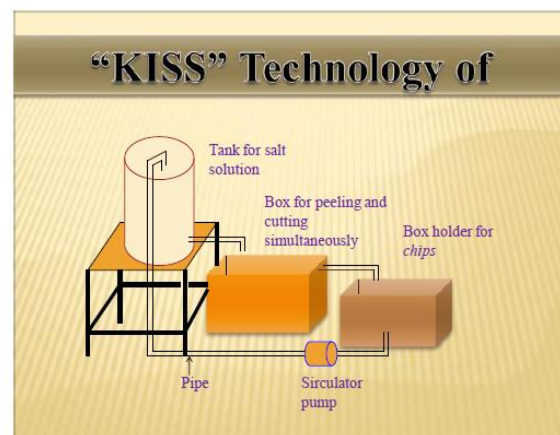
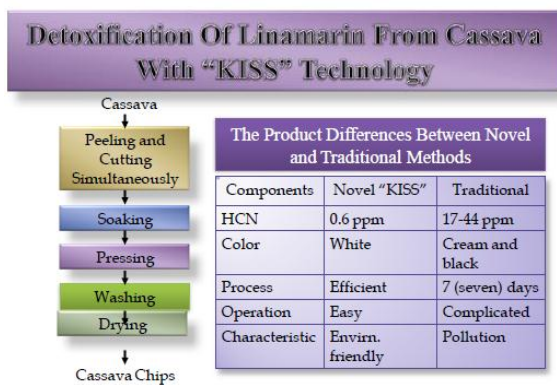
Pembentukan HCN



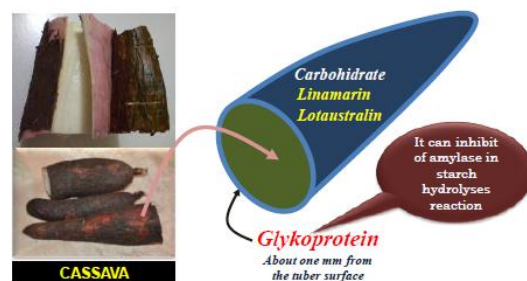
How to Decrease of Linamarin in Cassava Tuber?



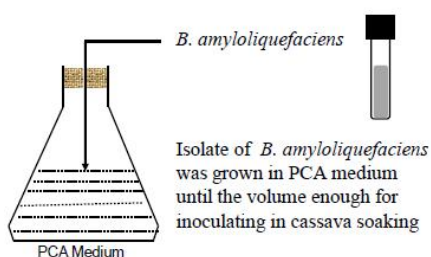
Soaking of cassava root resulted in a decrease in total cyanogen (Linamarin) content of 13- 52% after 24 hours, 73-75% after 48 hours and 90% after 72 hours (Agbor-Egbe and Lape Moome, 2006)



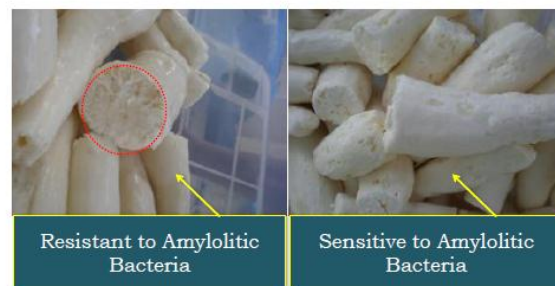
The Role of Glycoprotein in Cassava Tuber



Preparation of *Bacillus amyloliquefaciens* Inoculum



Hydrolyses of Carbohydrate



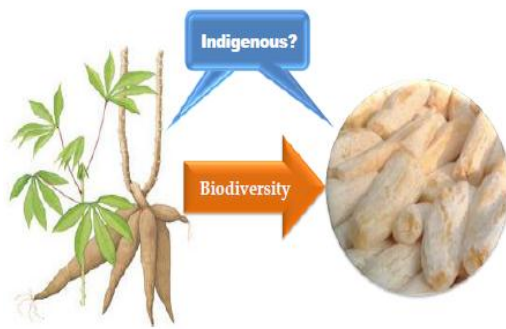
BEBI-Q: Produk Kreatif dan Inovatif



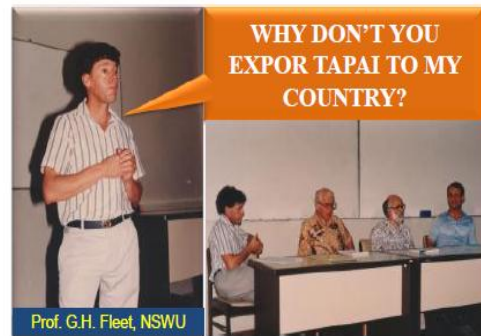
NOVEL PRODUCT OF CASSAVA RICE: BEBI-Q



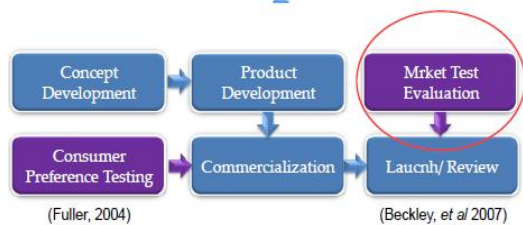
CASSAVA FOR TAPAI



Tapai as a Traditional Food of Indonesia



Managing Product Development



Good Quality of Tapai Influenced by The Quality Ragi



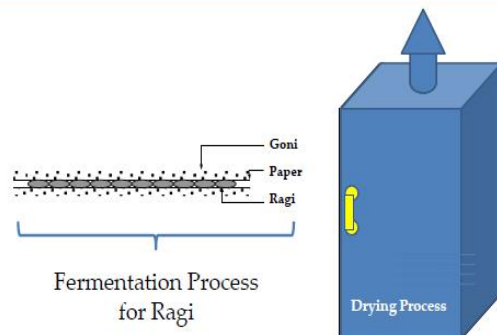
MIKROBIOLOGICAL OF RAGI



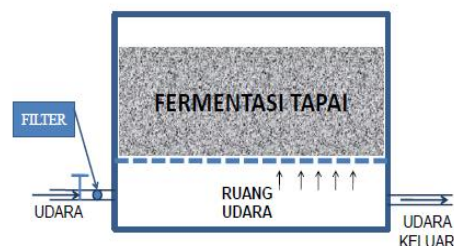
TECHNOLOGY DEVELOPMENT OF RAGI



INNOVATIVE TECHNOLOGY FOR MONOCONDIMENT RAGI



TECHNOLOGY DEVELOPMENT OF TAPAI





Ragi Tapai Bumbu Tunggal Alih teknologi tahun 2001 di Air Sugihan Kiri (AISUKI) sampai sekarang masih diproduksi, berkembang asetynya, perlu peningkatan kemasan yang lebih baik agar penampilan dan daya simpan meningkat dan pemasaran lebih luas lagi



THE TASTE IS MORE SWEET, LOW OR FREE ALCOHOL, CARAMEL FLAVOR, LONG AGE STORAGE

Innovative Tapai

Packaging of Tapai

Produk Kreatif-Inovatif dari bahan baku tapai dibuat dodol tapai yang lebih enak dan rasa pas untuk pangsa pasar ekspor



Other Local Resource for Food and Health

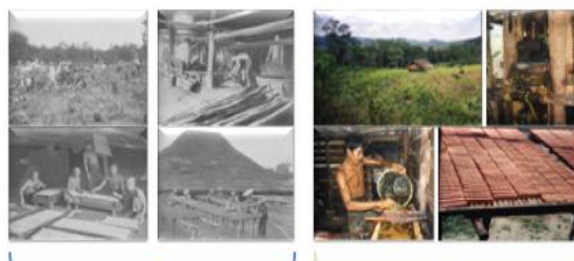
What do you think about Gambir? The Commodity you can find it in the Area of Rejang Lebong?

Gambir (*Uncaria gambir* Roxb) Who is care about this plant?



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THE NEGLECTED PLANT, NOBODY CARE UNTIL 1999



1899-1900
(Ardiyanto Galery, 2008)

1999-2000
Pambayun *et al*, 2000)

Mengapa peroduksi gambir masih bertahan sampai sekarang?



Banyak yang membutuhkan Pembeli pasti untung besar Kita tidak sadar bahwa Menjual produk setengah jadi ≈ rugi



It must be very important product, concerning with chemistry, microbiology, and chemical engineering to be used for formulating any products

Jenis Senyawa Katekin

Senyawa	R1	R2	R3
(+)-Katekin	H	OH	H
(-)-Katekin galat	H	OG	H
(+)-Galokatekin	OH	OH	H
(-)-Galokatekin galat	OG	OG	H
(-)-Epikatekin	H	H	OH
(-)-Epikatekin galat	H	H	OG
(-)-Epigalokatekin	OH	H	OH
(-)-Epigalokatekin galat	OH	H	OG

SENYAWA KATEKIN UTAMA DALAM GAMBIR ADALAH (+)-KATEKIN (PAMBAYUN *et al*, 2007)

JENIS KATEKIN DALAM GAMBIR

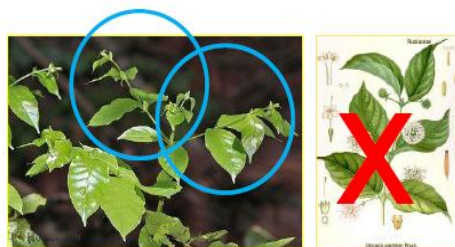
(Invensi Pertama: Lahir Ilmu tentang Senyawa Utama dalam Gambir)

- Pambayun *et al*, 2007a dan Pambayun *et al*, 2007b, jenis katekin dalam gambir adalah (+)-katekin
- Taniguchi *et al*, 2007. Senyawa gambirin adalah dimer dan oligomer (+)-katekin

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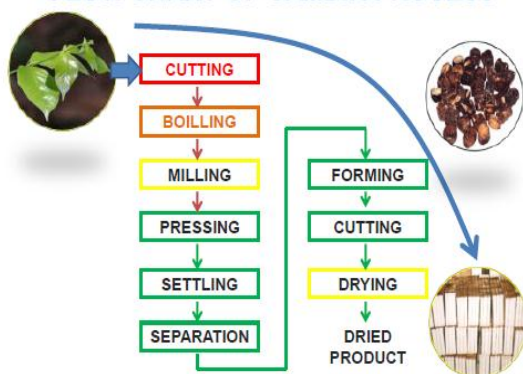
YOUNG LEAF HAS HIGH CATECHIN



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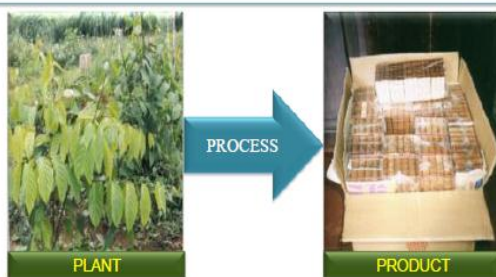
FLOW CHART OF GAMBIR PROCESS



Aneka Produk Gambir



PRODUCT OF GAMBIR (GAMBIER EXTRACT)



Ekstraksi dan Purifikasi dengan Berbagai Pelarut dan Metoda



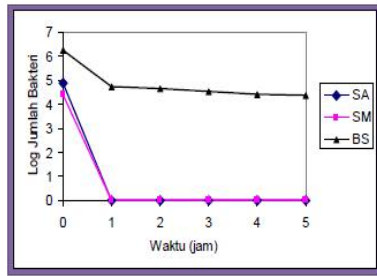
Extract dari gambir selanjutnya diujikan antioksidan dan antibakterinya

Minimum inhibitory concentration of gambir (*Uncaria gambir* Roxb) ethylacetate extract (Pambayun *et al*, 2007)

Konsentrasi Katekin (%)	Diameter Daerah Hambat (DDH), mm					
	EC	ST	SF	SM	S4	BS
0.50	0.00	0.00	0.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	0.00	0.00	0.00
1.50	0.00	0.00	0.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	0.00	0.00	0.00
2.50	0.00	0.00	0.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	10.33	9.67	9.33
4.00	0.00	0.00	0.00	11.33	10.67	10.00
10.00	0.00	0.00	0.00	14.67	14.33	14.00
15.00	0.00	0.00	0.00	16.33	15.67	15.33
20.00	0.00	0.00	0.00	19.67	17.67	17.00

Keterangan: EC=Escherichia coli, ST=Salmonella typhimurium, SF=Shigella flexneri, SM=Streptococcus mutans, S4=Staphylococcus aureus, dan BS= Bacillus subtilis.

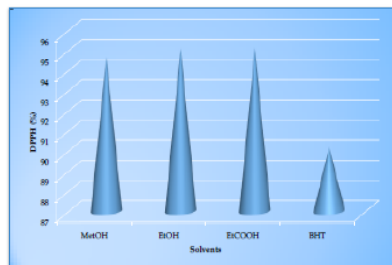
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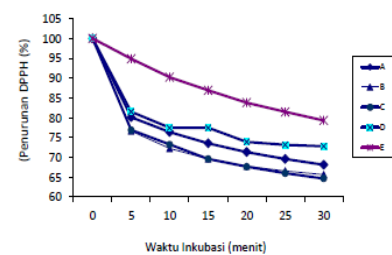
Laju kematian bakteri a) *Streptococcus mutans*, b) *Staphylococcus aureus*, dan c) *Bacillus subtilis* yang ditumbuhkan pada media *Nutrient Broth*, inkubasi 37 °C selama 10 jam setelah diintroduksi dengan perlakuan katekin pada kadar 8 %.



Antioxidant of Gambier Extract



The Extract of gambier leaves has high potency as antioxidant, even compare to butylated hydroxy toluen (BHT) (Pambayun, *et al*, 2011)



Antioxidant characteristic of gambier extract expressed by decreasing of DPPH (%) with incubation time 30 minutes use interval 5 minutes [A=Aquades and ethanol (1:1), B=Ethanol and Ethyl Acetate (1:1), C= Ethyl Acetate, D= Rutin, and E-BHT]

FOOD (MEAT BALL) PRESERVATION WITH GAMBIER EXTRACT



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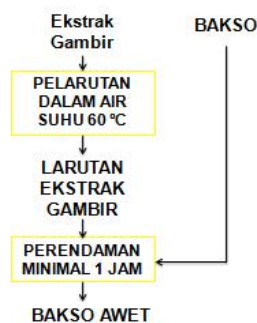
GAMBIER FOR FOOD PRESERVATIVE

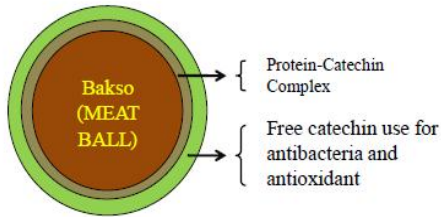
PENGUJIAN ORGANOLEPTIK BAKSO YANG DIAWETKAN DENGAN GAMBIR



MESKIPUN WARNA BERUBAH KECOKLATAN, RASA BAKSO BERKATEKIN LEBIH ENAK

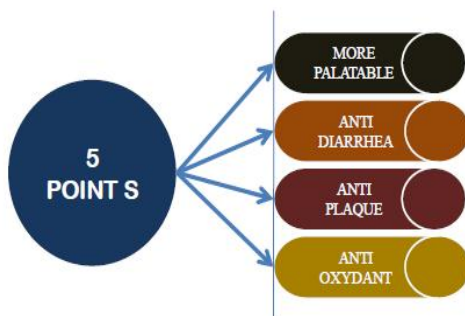
PROSES PENGAWETAN





Coating Model of Meat Ball by Catechin

THE ADVANTAGES OF BAKSO PRESERVED BY GAMBIER EXTRACT



Paten Pengawet Bakso



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Pengujian Keamanan



Offered Product



DIPRODUKSI DALAM JUMLAH BESAR DALAM WADAH SATUAN TERTENTU UNTUK PENGAWETAN BAKSO DAN TAHU DI PASAR, SEHINGGA BAKSO DAN TAHU SEGAR BERTAHAN HINGGA ENAM HARI

GAMBIER FOR HEALTH: AS A FUNCTIONAL DRINK

Green Tea Mixed with Gambier To Produce Functional Drink

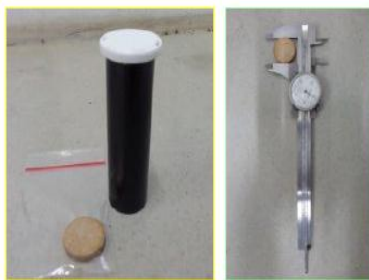


Sinergy between epigallo catechin gallate with catechin of gambier

LAUNCHING OF GREEN TEA GAMBIER PRODUCT



Effervescent Tablet for Functional Drink



GAMBIER FOR FUNCTIONAL CANDY (ANTIPLAQUE AND ANTICARIES)

Gambir Digunakan Nenek Moyang



Gambier is used in Indonesia for chewing with areca and betel, for tanning, and for dyeing. It contains many catechins which are known to have many medicinal properties and are components of Chinese herbal remedies and certain modern medicines (Leen et al, 2003).



Gambir: Stopping the role of *Streptococcus mutans* to form plaque and caries

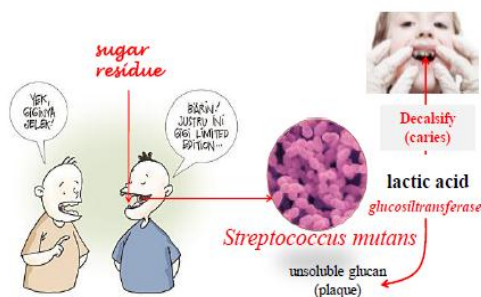
Good therapy for avoiding plaque and Caries?



Chewing betel leaves and gambir showed that the teeth avoid from plaque and caries

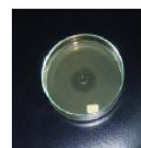
How it can be?

Plaque and Caries Formation on Teeth



Scientific Explanation

Based on the DATA, catechin inhibit Gram-positive bacteria *Streptococcus mutans*



Streptococcus mutans inoculum



Gram-positive bacteria introduced with gambir extracts

Antiplaque Testingin Junior High School



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Mean of dental plaque index

Group	Plaque Index before	Plaque Index before
A	2,75 ± 0,144	1,55 ± 0,16
B	2,70 ± 0,687	1,89 ± 0,53
C	2,54 ± 0,12	2,17 ± 1,9
D	2,81 ± 2,17	2,79 ± 2,77
E	2,16 ± 0,30	2,41 ± 0,34

Explanation:

- Group A : Chewing 5% extract-gambir-containing candy
- Group B : Chewing 7,5% extract-gambir-containing candy
- Group C : Chewing 10% extract-gambir-containing candy
- Group D : No chewing candy
- Group E : Chewing sucrose-containing candy

GAMBIER FOR BEAUTIFULNESS (MASKER DAN MINUMAN)



4. For beautifulness



The Offered Product of Beautifulness Scrubes



**Ingredient: Natural Antioxidant
(+)-catekin from gambir**

Aturan Pakai
Ambil secukupnya, larutkan dalam air hangat, oleskan sambil dipijit di permukaan kulit biarkan selama minimal dua jam dan cuci dengan air hangat

GAMBIER FOR FUNCTIONAL endurance (strong men and women)

Other Traditional Function: Basic Formulation

Abu Nawar's Recipe (2001) Pesisir
Selatan, Padang West Sumatera



"Taluk ayam kampung, madu satu sendok, sakare gambier, setengah gale air panas, diaduk sampe bebuih, anget langsung diminum!"

Reward for Research Result From The Government



Penghargaan APN Bidang Penelitian dari Menteri Pertanian Republik Indonesia dan Tropi dari Presiden RI, 2012

Indonesia is Rich Country, Has Many Potential Resources



